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EXAMINER	
AMAYA, CARLOS DAVID	
ART UNIT	PAPER NUMBER
2836	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/788,911	ROWAN, BRYAN S.	
	Examiner	Art Unit	
	Carlos Amaya	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This communication is responsive to amendments filed on 12/04/2006.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-11, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alston (US 6,327,635) in view of Lee (US 6,650,096).

With respect to claim 1 Alston discloses a circuit for sensing an input supply voltage and providing a desired output voltage (Power source selection circuit 210 of Figure 3 provides a desired output voltage based on two input voltages), the circuit comprising: a voltage sensing circuit (Column 4 lines 1-2), configured to sense, at least at a predetermined time, a value of the input supply voltage and provide a voltage indication signal based on the supply voltage, so sensed (Column 4 lines 12-16); a control circuit (Driver 302), responsive to said voltage indication signal, that generates a control signal (Column 4 lines 12-16); and a switching element (Switches 310 and 312) having a control terminal that receives said control signal; said control signal being different for different first and second values of said supply voltage, so sensed (Depending on the sense voltage the Driver 302 turns the switches 310 and 312 on or off), wherein said first value of said supply voltage, so sensed, is different from said desired output voltage (As shown in figure 3 two inputs voltages in lines 212 and 214

are sensed, thus depending on the desired output either of the two inputs is selected to be different from the desired output voltage).

Alston, however, does not disclose expressly that the control signal is in the form of a pulse train for switching said switches element for said first value of said supply voltage, so sensed.

Lee discloses on Figure 6 that switches 108, 110 are control by signals V1-V4 coming from a PWM controller 104 to control the on and off of the switches in a pulse fashion. Lee's invention is rely upon for the teaching of a control signal in the form of a pulse train to control the state of a switch on/off (open closed), col. 3 lines 47-50.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to control the switches in Alston's invention by a PWM controller as disclosed by Lee. Furthermore one of ordinary skill in the art would provide a pulse train signal to the switches 310 and 312 with a 100% duty cycle or 0% duty cycle, which would be seen by the switches as an on or off signal, thus a person of ordinary skill in the art would modify the duty cycle to meet certain output requirements.

The suggestion or motivation for doing so would have been to obtaining a desired output voltage that meets certain voltage requirements of a system, regardless of the input voltage.

With respect to claim 2 Alston in view of Lee discloses the circuit of claim 1 wherein said predetermined time is at power-on (According to Alston the add-on card is connected to a computer system via an expansion slot connected to a bus, thus it would be obvious that the predetermined time is when power is first transmitted to the card).

With respect to claim 3 Alston in view of Lee discloses the circuit of claim 1 wherein said desired output voltage is used to power motors and logic in a hard disk drive (Alston disclose in Figure 1 that the invention is used in a computer system, power is provided to the different components of the system via bus 106, one of the components receiving power is a CPU 102, thus it would necessary provide power to the HDD and its components. Lee also discloses that the voltage regulator provides power to a processor 401 and other computer systems such as a hard disk drive 438, Column 6 lines 16-20).

With respect to claim 4 Alston in view of Lee discloses the circuit of claim 1 wherein said first value of said sensed supply voltage is lower than said second value of said sensed supply voltage (Alston discloses that the voltage on supply line 212 is lower than the voltage in line 214).

With respect to claim 5 Alston in view of Lee discloses the circuit of claim 1 wherein: said second value of said sensed supply voltage is equal to said desired output voltage; and said control signal is in the form of a fixed level for said second value of said supply voltage, so sensed. Alston does not disclose expressly that the second value sense is equal to said desired output. However Alston discloses that the voltage on line 212 is equal to the desired output, and that the control signal is in the form of fixed level to control the switches 310 and 312 to turn them on and supply the voltage on line 212 directly to the output. Thus one would have envisioned making either one of the voltages in supply lines 212 and 214 to be of first and second values and making the second value the desired output.

With respect to claims 6 and 7 Alston in view of Lee discloses the circuit of claim 5 wherein said fixed level is such as to keep said switching element in an ON and OFF state (Alston Column 4 lines 6-12, lines 48-50).

With respect to claim 8 Alston in view of Lee discloses the circuit of claim 1, and further comprising a second switching element having a control terminal, and wherein: said control circuit is further configured to provide a second control signal based on the supply voltage (Drive 302 is able to provide two type of signals depending on the sensed voltages), so sensed, to said control terminal of said second switching element (Switch 312); and said second control signal is such as to maintain said second switching element in an ON state for one of said first and second values of said supply voltage and in an OFF state for the other of said first and second values of said supply voltage (Control circuit turns the Switch 312 on and off depending on the values of the supply voltages).

With respect to claim 9 Alston in view of Lee discloses the circuit of claim 8, and further comprising a third switching element having a control terminal (Lee discloses a regulation system having 4 control switches), and wherein; said control circuit is further configured to provide a third control signal based on the supply voltage (Alston does not disclose the control circuit having a third control signal nor a third switching element, but a switch element and control signals would have necessary be provided in the regulator 308, the switch element would have been necessarily controlled by a pulse train. Thus Lee does discloses a control circuit (PWM controller 104) for controlling the switches), so sensed, to said control terminal of said third switching element; and said third control

signal is a pulse train (PWM) for switching said third switching element for one of said first and second values of said supply voltage, and a fixed level for the other of said first and second values of said supply voltage. It would have been obvious to combine the teachings of Alston for controlling a switch in a fixed level (or in a pulse train as would necessarily by the case for the regulator) with Lee's invention having PWM controller 104 for controlling a switch element.

With respect to claim 10 Alston in view of Lee discloses a chipset for a hard disk drive comprising: the circuit of claim 1; and a motor control circuit powered by said desired output voltage from said circuit. Lee discloses that his regulation system is for furnishing power to components of a computer system among those components are a hub 422, which represents a semiconductor devices or chipset, and provides interfaces for a hard disk drive 438, Column 6 lines 44-47.

With respect to claim 11 Alston in view of Lee discloses a hard disk drive comprising: the circuit of claim 1; a magnetic disk; a spindle motor connected to said disk to rotate said disk upon the application of power; a head for reading and writing data from and to said disk; a head motor connected to move said head across said disk upon the application power; and a motor control circuit coupled to said spindle motor and said head motor to control the application of power to said spindle motor and said head motor; at least one of said spindle motor, a head motor, and motor control circuit receiving power supplied by said circuit. Lee discloses that the regulator is for furnishing power to components of a computer system among those components are a hub 422, which represents a semiconductor devices or chipset, and provides interfaces

for a hard disk drive 438, Column 6 lines 44-47. It is well known that HDD comprises magnetic disks, spindle motors, a read/write head, and motor control circuits thus it would have been obvious to use the invention disclose by Alston and Lee to supply power to the HDD as disclosed in the claim.

With respect to claim 19, the modified Alston discloses the invention substantially as claimed except for the power distribution being used in a HDD comprising: a magnetic disk; a spindle motor connected to said disk to rotate said disk upon the application of power; a head for reading and writing data from and to said disk; a head motor connected to move said head across said disk upon the application of power; and a motor control circuit coupled to said spindle motor and said head motor to control the application of power to said spindle motor and said head motor.

Lee discloses power distribution system (Voltage regulation system 100) for furnishing power to components of a computer system among those components are a hub 422, which represents a semiconductor devices or chipset, and provides interfaces for a hard disk drive 438, Column 6 lines 44-47. It is well known that HDD comprises magnetic disks, spindle motors, a read/write head, and motor control circuits thus it would have been obvious to use the invention disclose by Alston and Lee to supply power to the HDD.

The suggestion or motivation for doing so would have been to provide the HDD with the required type of power from the different voltages available; the regulator regulates the power being supply to the HDD.

4. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alston (US 6,327,635) in view of Lee (US 6,650,096) in further view of Shenai (US 5,959,439)

With respect to claim 20 Alston in view of Lee disclose the circuit of claim 19, however, they don't disclose expressly that said voltage supply node is at 5 volts; at least one component of said hard disk drive requires a voltage greater than 5 volts; and said DC-DC conversion circuit includes a switching regulator that converts 5 volts to a higher voltage.

Shenai discloses a DC-DC voltage converter 10, and also that processor in personal computers require power at a level of 5 volts or less, and a hard disk drive require 12 volts or more, thus one have to work around to meet the desired output voltage (Column 1 lines 31-38). The input voltage in Shenai invention is 5 volts that are step up to a final output voltage of 10 volts by a switching DC to DC voltage converter. Thus it would have been obvious to one of ordinary skill in the art to have an input that is at lower value than the voltage desired at the output as is disclosed by Shenai.

The suggestion or motivation for doing so would have been to be able to work with different voltages ranges that are supplied and be able to provide a desired output regardless of the input voltages.

With respect to claim 21 and 22 Alston in view of Lee disclose the circuit of claim 19, however, they don't disclose expressly that the voltage supply node is at 12 volts; no components of said hard disk drive require a Voltage greater than a predetermined voltage that is less than 12 volts; and said DC-DC conversion circuit includes a

switching regulator and a linear regulator that converts 12 volts to a voltage that is less than 12 volts.

Shenai discloses a DC-DC voltage converter 10, and that processor in personal computers require power at a level of 5 volts or less, and a hard disk drive require 12 volts or more, thus one have to work around to meet the desired output voltage based on the voltage is most commonly used (Column 1 lines 31-38), furthermore a regulator can be used to step-up or step-down an input voltage to meet a desired output. Thus it would have been obvious to one of ordinary skill in the art to have an input that is at a higher value than the voltage desired at the output as is disclosed by Shenai. DC to DC converters can be of different types as disclosed by Shenai thus the use of converter/regulator to step up or down an input voltage is matter of design choice, as well as, the type of converter/regulator used.

The suggestion or motivation for doing so would have been to be able to work with different voltages ranges that are supplied and be able to provide a desired output regardless of the input voltages.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 12-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Alston (US 6,327,635).

With respect to claim 12 Alston discloses a circuit for powering a hard disk drive (The system disclose by Alston powers among other components a CPU102, thus it would necessarily provide power to a HDD), the circuit comprising: a voltage sensing circuit (Column 4 lines 1-2), configured to sense, at least at a predetermined time, a single supply voltage at one input node (Alston discloses that the system is able to operate on a single supply only, see abstract) and provide a voltage indication signal based on the supply voltage, so sensed (Column 4 lines 12-16); at least one DC-DC conversion circuit (Regulator 308), connected to said input node and to an output node, for converting said single supply voltage, so sensed, to a different desired output voltage and providing said different voltage on said output node(As shown in figure 3 Regulator 308 is connected to an input voltage line having a different voltage than the desired output voltage; the regulator converts the input voltage into the desired output voltage on line 222); and a control circuit (Driver 302), coupled to said voltage sensing circuit and to said DC-DC conversion circuit for controlling said DC-DC conversion circuit depending on said supply voltage, so sensed (the voltage sensing is composed of various components that are couple together including the switches and the voltage regulator, which is control by the driver 302 depending on an input voltage).

With respect to claim 13 Alston discloses a circuit for powering a hard disk drive (The system disclose by Alston powers among other components a CPU102, thus it would necessarily provide power to a HDD), the circuit comprising: a voltage sensing circuit (Column 4 lines 1-2), configured to sense, at least at a predetermined time, a

single (Alston discloses that the system is able to operate on a single supply only, see abstract) supply voltage at one input node and provide a voltage indication signal based on the supply voltage, so sensed (Column 4 lines 12-16); at least one DC-DC conversion circuit (Regulator 308 Figure 3), connected to said input node and to an output node, for converting said single supply voltage, so sensed, to a different desired output voltage and providing said different voltage on said output node (As shown in figure 3 Regulator 308 is connected to an input voltage line having a different voltage than the desired output voltage; the regulator converts the input voltage into the desired output voltage on line 222); a switchable pass-through path (Switches 310 and 312) between said input node and said output node; and a control circuit (Driver 302), coupled to said voltage sensing circuit, said DC-DC conversion circuit, and said switchable pass-through path (the voltage sensing is composed of various components that are couple together including the switches and the voltage regulator); said control circuit controlling said DC-DC conversion circuit and said switchable pass-through path so that: when said voltage indication signal indicates that said single supply voltage is different from said desired output voltage, said control circuit enables said DC-DC conversion circuit to supply said different voltage on said output node, and prevents said pass-through path from passing said supply voltage to said output node (Driver 302 controls voltage regulator to convert an input voltage to a desired output, and also turns switches 310 and 312 off); and when said voltage indication signal indicates that said supply voltage is equal to said desired output voltage, said control circuit prevents said DC-DC conversion circuit from supplying said different voltage on said output node, and

allows said pass-through path to pass said supply voltage to said output node (When the input voltage is equal to the desired output voltage, the driver 302 turn the switches on allowing the input voltage to pass through the output line 222).

With respect to claim 14 Alston discloses the circuit of claim 13, the features are inherent from the regulator of Alston wherein said desired output voltage is greater than said voltage sensed at said input node.

With respect to claim 15 Alston discloses the circuit of claim 13 wherein said desired output voltage is less than said voltage sensed at said input node. Alston discloses that one of the input voltages, the voltage in line 214, is greater than the desired output voltage.

With respect to claim 16 Alston discloses the circuit of claim 13 wherein said DC-DC conversion circuit is a switching regulator (Voltage regulator 308, Alston does not disclose that regulator 308 is a switching regulator. Most regulators operate using switches to convert an input voltage to a different output).

With respect to claim 17 Alston discloses the circuit of claim 13 wherein said control circuit prevents said DC-DC conversion circuit from supplying said different voltage on said output node by disabling said DC-DC conversion circuit (Driver 302 and an inverter 306 shuts off the regulator, Column 4 lines 40-42).

With respect to claim 18 Alston discloses the circuit of claim 13 wherein said DC-DC conversion circuit includes a switching element that is also located in said pass-through path. As shown in figure 3 Regulator 308 is connected to the pass-through

path, thus it would necessarily have switches that are connected in said path, providing the desired output voltage that passes through the path.

Response to Arguments

7. Applicant's arguments filed 12/04/2006 have been fully considered but they are not persuasive.

With respect to the arguments of claim 1 and that the pulse width signal of Lee would destroy the function of the power selection circuit disclosed by Alston one of ordinary skill in the art would provide a pulse train signal to the switches 310 and 312 with a 100% duty cycle or 0% duty cycle, which would be seen by the switches as an on or off signal, thus a person of ordinary skill in the art would modify the duty cycle to meet certain output requirements. Lee's invention is rely upon for the teaching of a control signal in the form of a pulse train to control the state of a switch on/off (open closed), col. 3 lines 47-50.

With respect to the argument that voltage regulation system 100 of Lee resides separately from the hard disk drive 438, examiner would like to point out that is well known to include a regulation system within a HDD as disclose in the submitted prior art fig. 1A.

With respect to claims 12 and 13 Alston discloses that the system is able to operate on a single supply only with the add-on card operating in 3.3V or a 5V level. See abstract.

Conclusion

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlos Amaya whose telephone number is (571) 272-8941. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (571) 272-2800. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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